ATARI® 400/800™

COMPUTER PROGRAM
TELELINK™ I

ATARI®

A Warner Communications Company

Model CXL4015
Use with
ATARI® 400™ or ATARI 800™
PERSONAL COMPUTER SYSTEMS

TELELINK™ I

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CONTENTS

GENERAL DESCRIPTION

TeleLink™ I is a program cartridge that enables the user to communicate with another computer over standard telephone lines when used with the **ATARI® 830™ Acoustic Modem**. The ATARI 830 Modem is fully compatible with the Bell 103A Modem and other similarly operated modems. To use the TeleLink I cartridge, connect the **ATARI 850™ Interface Module** and the ATARI 830 Modem to either the **ATARI 400™** or **ATARI 800™ Personal Computer System**. This cartridge can be used in conjunction with any of the ATARI Printers (820™, 822™, or 825™) to provide a hardcopy printout of your system's telephone conversation with a remote system.

The word modem stands for modulator-demodulator. Its function is to convert data you type on the ATARI Computer into signals that can be sent over standard telephone lines. As data is received at the other end of the telephone line, the modem on the remote system demodulates (converts) the signal back into data that the remote computer can understand.

TeleLink I provides a direct link to time-sharing systems, computer data bases, and information utilities such as CompuServe, Tymnet, The Dow Jones Information Service, and The Source (see Section 7 Helpful Definitions). Once you have established the connection with another computer, a conversation may begin. Each of these systems has its own set of procedures for signing on, signing off, running programs, backspacing, and other functions unique to each environment. The TeleLink I package includes free access time on several of these systems and the special instructions necessary to carry on a conversation. After properly ending a conversation, simply switch the ATARI 830 Modem to OFF and hang up the telephone.

CONNECTING THE SYSTEM

Refer to Figure 1 if you have the **ATARI 820™** or **ATARI 822™ Printer**, or Figure 2 if you have the **ATARI 825™ Printer**, and follow these steps below. For complete instructions to set up your ATARI Personal Computer System, please refer to the *ATARI 400* or *ATARI 800 Operator's Manual* and the appropriate operator's manuals for any additional peripheral equipment you may have.
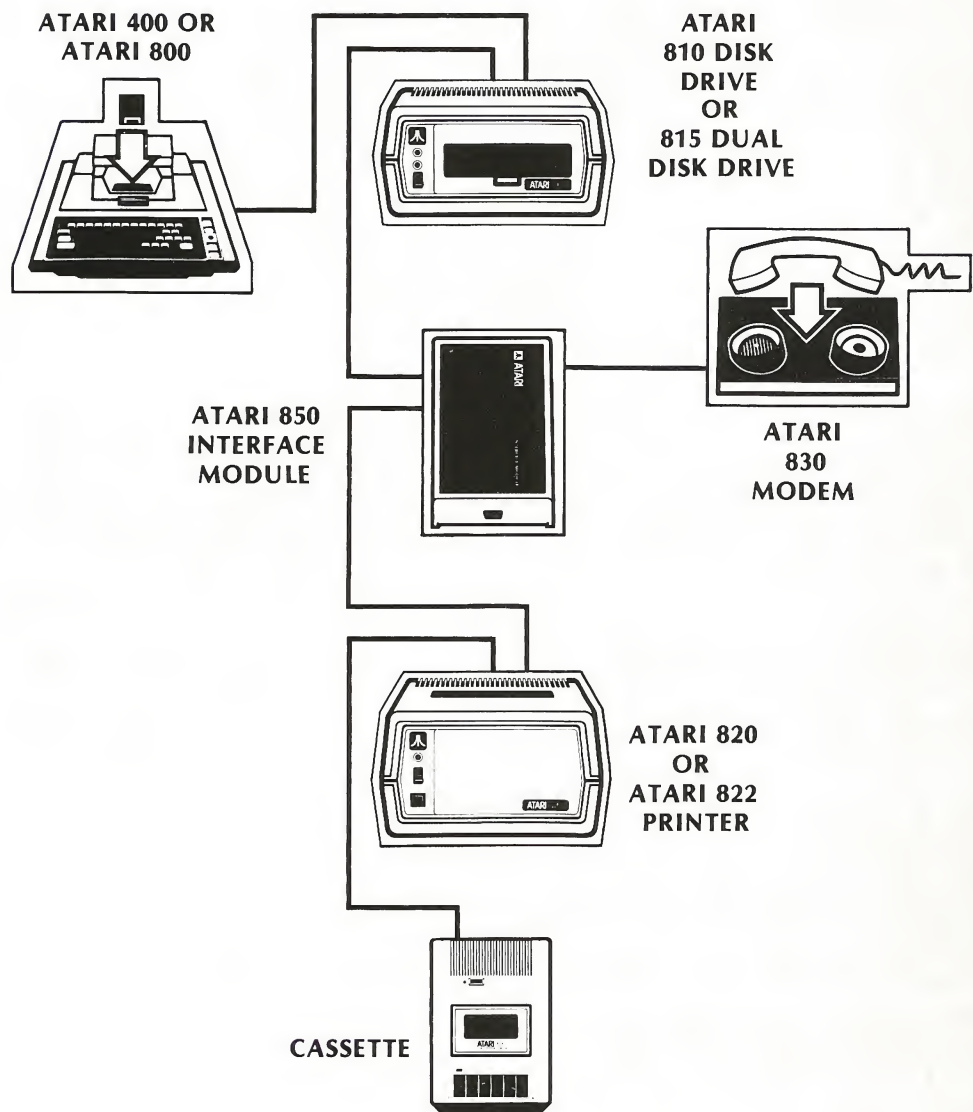

Figure 1   Using the ATARI 820 or ATARI 822 Printer
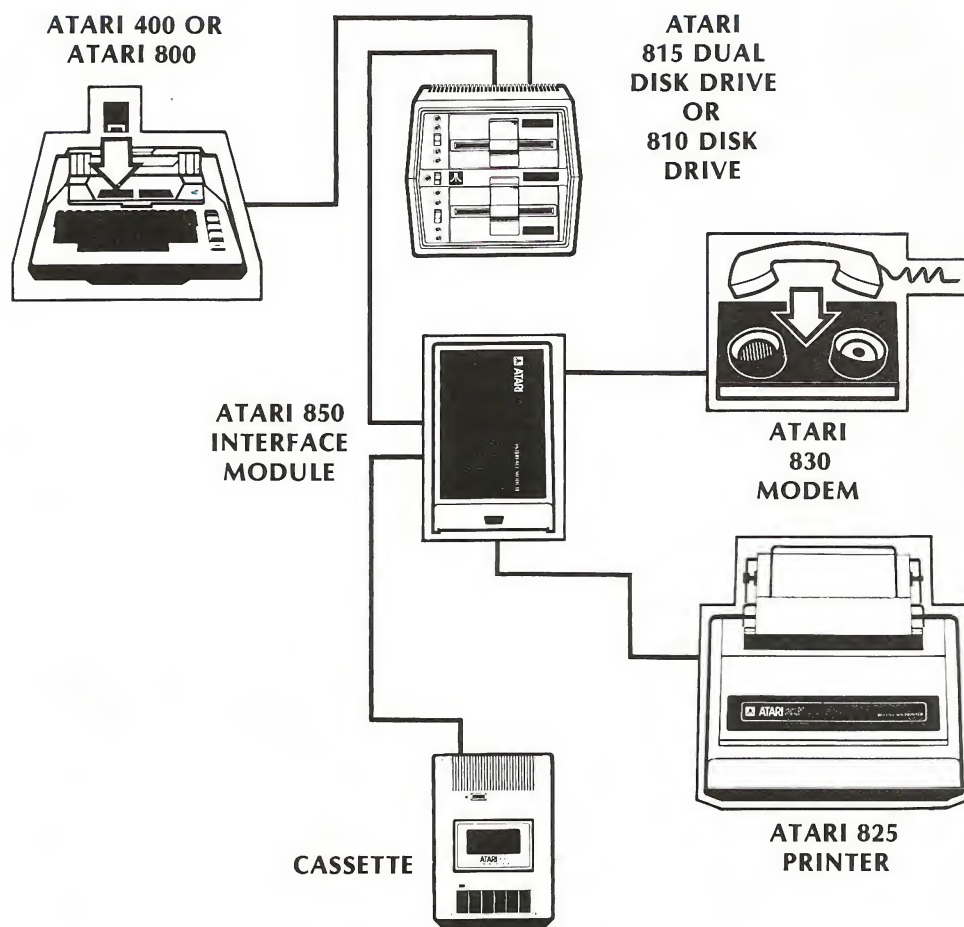
Figure 2   Using the ATARI 825 Printer

1. Plug the ATARI 400 or ATARI 800 computer into the ATARI 850 Interface Module at either peripheral port.

2. Plug the printer into ONE of the following:

    •   The ATARI 850 Interface Module if using the ATARI 825 Printer (see System Diagram). Use printer cable (ATARI Part No. CA015544) packaged with the printer.

    •   The computer or the I/O connector port of any peripheral device if using the ATARI 820 or ATARI 822 Printer (see System Diagram). Use the I/O cable (ATARI Part No. CA014122) packaged with each of these printers.

3. You MUST plug the ATARI 830 Modem into Serial Port 1 of the ATARI 850 Interface Module. (Refer to the *ATARI 850 Interface Module Operator's Manual* for additional information on hook-up procedures.) Use the cable (labeled "Modem" CA015710-02) that comes with the Modem.

Note: If you have any disk drives connected to your system, turn them OFF. This is necessary for TeleLink I to function.

OPERATION

You can use the TeleLink I cartridge with either the ATARI 400 or the ATARI 800 Personal Computer System. Insert the cartridge (see diagram below) in the cartridge slot (LEFT cartridge slot on the ATARI 800). The ATARI 400 and ATARI 800 Personal Computer Systems automatically shut off whenever the cartridge door is lifted. This prevents damage to the computer and to the cartridge.

CARTRIDGE

CARTRIDGE

ATARI 400™   **ATARI 800™**
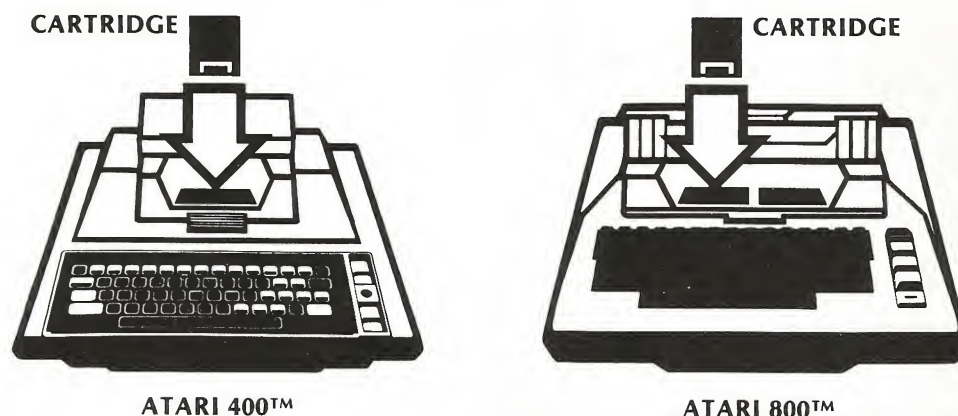
Caution: When setting up your ATARI Personal Computer System, it is very important that the ATARI 830 Modem is used only with the AC power adapter supplied with the modem. This power adapter is NOT interchangeable with other ATARI AC power adapters.

Use the following procedure to begin transmitting data with your TeleLink cartridge:

1. If you have an **ATARI 810™** or **ATARI 815™ Dual Disk Drive** attached to the system, turn the disk drive power to OFF. (**TeleLink I will not operate with a disk drive turned on.**)

2. Switch the ATARI 850 Interface Module power to ON.

3. Set the **ANS/OFF/ORIG** switch on the ATARI 830 Modem to ORIG.

4. Set the **FULL/TEST/HALF** to **FULL** or **HALF** as required by the computer at the other end of the communication link.

5. Turn the computer console power switch to ON. After you have turned the computer console on, you will hear clicking and beeping sounds through the television speaker. These are the normal sounds of the TeleLink program and the interface module setting up.

6. Dial the telephone number to the remote system.

7. When you hear the high-pitched tone, place the telephone receiver into the modem cradle. (See Figure 1 or Figure 2 for positioning the handset onto the modem.)

8. When you see the modem READY indicator on, you can begin data transmission.

9. Type in the appropriate "logon" code. This code varies with each particular time-share system. You will need to refer to the documentation provided with your time-sharing account for the codes your system requires.

ERROR MESSAGES

RS232 Error: 138. This means the ATARI 850 Interface Module did not start up properly. Check to see if your disk drives are OFF and the Interface Module is ON before you turn on your ATARI 400 or ATARI 800 Personal Computer System.

Printer Error: 138. There is no printer connected to the system, or its power is turned OFF.

Printer Error: 139. The printer is switched OFFLINE (ATARI 825 Printer only).

USER CONTROLS

The memory buffer of TeleLink I can save up to 1.5K bytes of data received over the modem before the information must be emptied to the printer. Generally speaking, when the buffer is nearing capacity (at 1K bytes), communications over the modem must be suspended and the contents of the buffer sent to the printer. If the printer is not on, a printer error appears. Exactly how suspension of communication for printing occurs depends on whether you are in the Automatic or Manual Mode.

AUTOMATIC MODE

When the buffer is near capacity, your system sends an XOFF (transmit OFF) character to the remote system. A brief delay (one second) occurs and then your computer ignores the modem while the printing of stored data takes place. When the printing is done, your computer returns to the modem and sends an XON (transmit ON) character to the remote system telling it to reinitiate transmission.

Note: Not all remote systems react quickly enough for you to use the Automatic Mode. You can simulate and check this mode by typing a `CTRL` **S** (XOFF) and checking the time it takes for the data to stop coming to the screen. You CAN-NOT use the Automatic Mode if it takes longer than one second, or if the remote system does not stop at all on XOFF. If you try to use Automatic Mode with either of these situations occurring, you will lose characters being sent by the remote system while the printing takes place. Type a `CTRL` **Q** (XON) to continue after you run this test.

MANUAL MODE

When you are in the Manual Mode (and the buffer is near capacity of 1K bytes), the system assumes that the user will take care of suspending communications by the remote computer. The XOFF character (or its equivalent for the remote computer being used) is typed in by the user. When you are sure the remote computer has stopped transmitting, start the print operation by pressing either the `SELECT` or `OPTION` key. (Read the description of these keys under Printer Controls.) When the printing is done, you must tell the remote computer that transmission may resume. To do this, type the XON character (or whatever the equivalent is for the remote system being used).

When you hear a clicking noise, that indicates the buffer is near capacity. If you allow information to continue being received after the buffer is full (after 1.5K bytes), all further incoming information will be lost. To print the buffer when the clicking starts, follow the steps below:

1. Send a `CTRL` **S** character (or its equivalent) to the remote system to suspend communication.

2. After the data stops, press `SELECT` or `OPTION` to start the printer.

3. When the printer stops, send the restart (`CTRL` **Q**) command (as required by the remote system) to reinitiate communication transmission.

The following are the various user controls for TeleLink I:

PRINTER CONTROLS

KEYS	FUNCTION
`CTRL` **9**	`CTRL` **9** is used BEFORE you press `START` to take you back and forth between the Automatic Mode and Manual Mode. If you are in Manual Mode and you want to select Automatic Mode, do a `CTRL` **9**, and vice-versa. `CTRL` **9** can also be used AFTER you press the `OPTION` key to turn off the buffer when printing is complete.
`START`	`START` signals the buffer to begin data storage of data received from the remote system. In the Automatic Mode, printing will occur when the buffer is full. In the Manual Mode, the `START` key signals the buffer to begin storing data, and as it reaches 1K bytes of data the terminal makes a clicking noise. This signal should alert you to print the contents of the buffer by pressing `SELECT`.
`SELECT`	You can use `SELECT` to begin printing the buffer at any time. When printing is finished, the buffer will continue to collect text from the remote computer for the next printing. In the Automatic Mode, `SELECT` initiates a "print early" function. If `SELECT` is chosen during the Automatic Mode, the **computer** sends the XOFF and XON signals to the remote system. These signals are NOT sent by the computer when you are in the Manual Mode. Therefore, if you did not give the proper XOFF code to the remote system before pressing `SELECT`, you will lose any data transmitted while the printer is printing. You must familiarize yourself with the XOFF and XON type codes required by each system.
`OPTION`	`OPTION` is similar to `SELECT` except that it signals the buffer to stop collecting text from the remote system when the printing is complete. To start the buffer collecting data again, press the `START` key.

ADDITIONAL CONTROLS

KEYS	FUNCTION
`CTRL` **8**	`CTRL` **8** selects a wide screen mode that provides a 40-character screen width instead of the 38-character default width.
`CTRL` **0**	Use `CTRL` **0** to switch between word mode and character mode. Character mode displays exact text across the screen and divides words without a hyphen at the end of a line. The default is the word mode that does not break words, but instead moves the entire word to the next line, making the text easier to read.

Note: Press `SYSTEM RESET` to reestablish all default control modes.

Each computer system you communicate with can differ significantly. It is important that you understand the format of the remote computer. Both systems must be set to the same baud rate (300) and the same duplex (either FULL or HALF).

Note: If you want to establish communication between two ATARI Personal Computer Systems, one modem must be in the ORIGINATE mode and the other in the ANSWER mode. Both systems should use the HALF-DUPLEX mode.

You should ask yourself the following questions about the remote system your computer is connected to:

- Does it work at 300 baud?
- Is the system HALF or FULL duplex?
- How do I log on?
- How do I backspace to correct an error?
- How do I run a program?
- How do I stop a program?
- How do I suspend and restart data transfer from the remote system?
- How do I log off?

For those of you who connect to TYMNET, please note the following:

In order to ensure that TYMNET will give you an immediate response to the XON and XOFF commands, precede your log-in with a `CTRL` **R**. That is, when TYMNET says "Please Log In," you must type `CTRL` **R** (log-in).

CHARACTER CODES

The software contained in the TeleLink I cartridge converts some of the ATARI ATASCII characters into ASCII characters. The following table defines the transmission of these special key functions.

Keyboard Character Typed	Sends ASCII	Means (ASCII)
TAB	Control I	Tab
ESC	ESC	Escape
SHIFT CLEAR	Nothing	Local Clear Screen
SHIFT INSERT	Nothing	Nothing
⏶	Nothing	Nothing
CTRL TAB CLR	Nothing	Nothing
SHIFT TAB SET	Nothing	Nothing
RETURN	Control M	Return (CR)
BACK S	Control H	Backspace
SHIFT DELETE	Delete	Rubout
BREAK	Nothing (this is a safety feature)	Nothing
SHIFT BREAK		Transmits 1/2 second break
CTRL [	(	(
CTRL]	)	)
CTRL /		
CTRL ;		
LOWR		LOWR produces the lowercase mode.
SHIFT CAPS		SHIFT CAPS puts you back into the uppercase mode.
CTRL A through CTRL Z	ASCII Control A through Control Z	As defined by ASCII; note the following in particular:
CTRL G	Control G	Bell
CTRL H	Control H	Backspace
CTRL J	Control J	Linefeed
CTRL Q	Control Q	XON
CTRL S	Control S	XOFF

For a complete list of character codes, see the back page of this manual.

Printable characters received by your ATARI Personal Computer System are displayed on your screen as the characters defined by ASCII. Most CONTROL characters are ignored by your ATARI Personal Computer System except for the following:

CR	Produces new line (END OF LINE), the same as ASCII CR and LF together
FF	Clears the screen
BS	Backspaces
BELL	Bell

Most CONTROL characters received by the ATARI Printers will also be ignored with the following exceptions:

CR	Produces new line
BS	Depends on printer

HELPFUL DEFINITIONS

ANSWER MODE: This mode on the modem indicates which terminal is receiving the communication call. In the ANSWER mode you must manually answer the telephone and switch the ANS/OFF/ORIG control to ANS.

BAUD: The unit measurement of communication speed, usually measured in bits-per-second.

CompuServe: A personal computing service that provides computer programs, data bases, and other services to its customers.

DOW JONES INFORMATION SERVICES: Instantaneous access to the information resources of Dow Jones & Co., Inc., Reliable and concise business and financial news from *The Wall Street Journal, Barrons, Dow Jones News Wire,* and other associated data services.

DUPLEX: A general term referring to a communication circuit in which each end transmits and receives.

FULL-DUPLEX: A communication system in which each end can simultaneously transmit and receive.

HALF-DUPLEX: A communication system in which each end can transmit and receive data in either direction, but not simultaneously.

MARK: Signal equivalent to binary 1.

ORIGINATE MODE: This mode on the modem indicates which terminal is initiating the communication link.

PARITY: Parity is a method of checking binary numbers. An extra bit called a parity bit is added to the number. TeleLink I transmits even parity, and ignores parity received. This allows TeleLink I to receive data from systems transmitting even, odd, or no parity.

RS232: For communication between computers and computer-related equipment, the industry standard is the EIA RS232C. This method was adopted by the Electronic Industries Association to ensure interface uniformity between data communication equipment and data processing terminal equipment. The ATARI® 850™ Interface Module is equipped with four RS232 interface ports.

SPACE: Signal equivalent to binary 0.

THE SOURCE: The Source is a time-shared service offering personal computing programs and data bases.

XOFF: Signals remote computer to stop sending data. XOFF is `CTRL` **S**.

XON: Signals remote computer to begin sending data. XON is `CTRL` **Q**.

Time-Shared Personal Computing Services

CompuServe Information Service
5000 Arlington Centre Blvd.
Columbus, Ohio 43220
(614) 457-8600

Source Telecomputing Corporation
1616 Anderson Rd.
McLean, Virginia 22102
(703) 821-6660

Dow Jones News Retrieval
Post Office Box 300
Princeton, New Jersey 08540
1-800-257-5114
(609) 452-1511 (NJ)

Cable Reorder Numbers

Cable	ATARI Model No.
I/O Data Cord (5 feet)	CX81
ATARI 825™ Printer Cable	CX86
Modem Cable	CX87

ASCII CHARACTER CODES

Character	Decimal	Meaning	Hexadecimal
NUL	0	Null (Type `CTRL` `SPACE`)	00
SOH	1	Start of heading `CTRL` **A**	01
STX	2	Start of text `CTRL` **B**	02
ETX	3	End of text `CTRL` **C**	03
EOT	4	End of transmission `CTRL` **D**	04
ENQ	5	Enquiry `CTRL` **E**	05
ACK	6	Acknowledge `CTRL` **F**	06
BEL	7	Bell `CTRL` **G**	07
BS	8	Backspace `CTRL` **H**	08
HT	9	Horizontal tabulation `CTRL` **I**	09
LF	10	Line feed `CTRL` **J**	0A
VT	11	Vertical tabulation `CTRL` **K**	0B
FF	12	Form feed `CTRL` **L**	0C
CR	13	Carriage return `CTRL` **M**	0D
SO	14	Shift out `CTRL` **N**	0E
SI	15	Shift in `CTRL` **O**	0F
DLE	16	Data link escape `CTRL` **P**	10
DC1	17	Device control 1 `CTRL` **Q** XON	11
DC2	18	Device control 2 `CTRL` **R**	12
DC3	19	Device control 3 `CTRL` **S** XOFF	13
DC4	20	Device control 4 `CTRL` **T**	14
NAK	21	Negative acknowledge `CTRL` **U**	15
SYN	22	Synchronous idle `CTRL` **V**	16
ETB	23	End of transmission block `CTRL` **W**	17
CAN	24	Cancel `CTRL` **X**	18
EM	25	End of medium `CTRL` **Y**	19
SUB	26	Substitute `CTRL` **Z**	1A
ESC	27	Escape `ESC`	1B
FS	28	File separator `CTRL` [↑]	1C
GS	29	Group separator `CTRL` [↓]	1D
RS	30	Record separator `CTRL` [←]	1E
US	31	Unit separator `CTRL` [→]	1F
SP	32	Space	20
!	33	Exclamation point	21
''	34	Quotation mark	22
#	35	Number sign	23
$	36	Dollar sign	24
%	37	Percent sign	25

Character	Decimal	Meaning	Hexadecimal
&	38	Ampersand	26
'	39	Apostrophe	27
(	40	Opening parenthesis	28
)	41	Closing parenthesis	29
*	42	Asterisk	2A
+	43	Plus	2B
,	44	Comma	2C
-	45	Hyphen (minus)	2D
.	46	Period (decimal point)	2E
/	47	Right slant	2F
0	48	Zero	30
1	49	One	31
2	50	Two	32
3	51	Three	33
4	52	Four	34
5	53	Five	35
6	54	Six	36
7	55	Seven	37
8	56	Eight	38
9	57	Nine	39
:	58	Colon	3A
;	59	Semicolon	3B
<	60	Less than	3C
=	61	Equals	3D
>	62	Greater than	3E
?	63	Question mark	3F
@	64	Commercial at	40
A	65	Uppercase A	41
B	66	Uppercase B	42
C	67	Uppercase C	43
D	68	Uppercase D	44
E	69	Uppercase E	45
F	70	Uppercase F	46
G	71	Uppercase G	47
H	72	Uppercase H	48
I	73	Uppercase I	49
J	74	Uppercase J	4A
K	75	Uppercase K	4B
L	76	Uppercase L	4C
M	77	Uppercase M	4D
N	78	Uppercase N	4E
O	79	Uppercase O	4F
P	80	Uppercase P	50
Q	81	Uppercase Q	51
R	82	Uppercase R	52

Character	Decimal	Meaning	Hexadecimal
S	83	Uppercase S	53
T	84	Uppercase T	54
U	85	Uppercase U	55
V	86	Uppercase V	56
W	87	Uppercase W	57
X	88	Uppercase X	58
Y	89	Uppercase Y	59
Z	90	Uppercase Z	5A
[	91	Opening bracket	5B
\	92	Left slant	5C
]	93	Closing bracket	5D
∧	94	Circumflex	5E
__	95	Underscore	5F
'	96	Grave accent	60
a	97	Lowercase a	61
b	98	Lowercase b	62
c	99	Lowercase c	63
d	100	Lowercase d	64
e	101	Lowercase e	65
f	102	Lowercase f	66
g	103	Lowercase g	67
h	104	Lowercase h	68
i	105	Lowercase i	69
j	106	Lowercase j	6A
k	107	Lowercase k	6B
l	108	Lowercase l	6C
m	109	Lowercase m	6D
n	110	Lowercase n	6E
o	111	Lowercase o	6F
p	112	Lowercase p	70
q	113	Lowercase q	71
r	114	Lowercase r	72
s	115	Lowercase s	73
t	116	Lowercase t	74
u	117	Lowercase u	75
v	118	Lowercase v	76
w	119	Lowercase w	77
x	120	Lowercase x	78
y	121	Lowercase y	79
z	122	Lowercase z	7A
{	123	Opening brace	7B
|	124	Vertical line	7C
}	125	Closing brace	7D
~	126	Tilde	7E
DEL	127	Delete	7F

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